

CLAIMS

1. A material of a positive electrode for a secondary lithium cell, characterized in that the material is a particulate active material of positive electrode for a secondary lithium-ion cell represented by a general formula, $\text{Li}_a\text{Co}_b\text{A}_c\text{B}_d\text{O}_e\text{F}_f$ (A is Al or Mg, B is a group-IV transition element, $0.90 \leq a \leq 1.10$, $0.97 \leq b \leq 1.00$, $0.0001 \leq c \leq 0.03$, $0.0001 \leq d \leq 0.03$, $1.98 \leq e \leq 2.02$, $0 \leq f \leq 0.02$, and $0.0001 \leq c + d \leq 0.03$), and that element A, element B and fluorine are evenly present in the vicinity of the particle surfaces.
2. The material of a positive electrode for a secondary lithium cell according to claim 1, characterized in that at least a part of said element represented by A or B contained in said particulate active material of a positive electrode for a secondary lithium-ion cell has substituted for cobalt atoms in the particles to form a solid solution.
3. The material of a positive electrode for a secondary lithium cell according to claim 1 or 2, characterized in that the atomic ratio of said element A to said element B is $0.33 \leq c/d \leq 3.00$, provided that $0.002 \leq c + d \leq 0.02$.
4. The material of a positive electrode for a secondary lithium cell according to any one of claims 1 to 3, characterized in that the abundance of the single-component oxide of said element B is 20% or less.
5. The material of a positive electrode for a secondary lithium cell according to any one of claims 1 to 4, characterized in that said element A is magnesium.
6. The material of a positive electrode for a secondary lithium cell according to any one of claims 1 to 5, characterized in that said element B is zirconium.
7. The material of a positive electrode for a secondary lithium cell according to any one of claims 1 to 6, characterized in that no diffraction peaks are observed at 2θ of $28 \pm 1^\circ$ in a high-sensitivity X-ray diffraction spectrum using Cu-K α ray.
8. The material of a positive electrode for a secondary lithium cell according to any one of claims 1 to 7, characterized in that said particulate active material of a positive electrode for a secondary lithium-ion cell consists of secondary particles

each formed by coagulation of 10 or more primary particles, and the average particle diameter of said secondary particle is from 2 to 20 μ m.

9. A method of producing a material of a positive electrode for a secondary lithium cell where the material is a particulate active material of a positive electrode for a secondary lithium-ion cell represented by a general formula, $\text{Li}_a\text{Co}_b\text{A}_c\text{B}_d\text{O}_e\text{F}_f$ (A is Al or Mg, B is a group-IV transition element, $0.90 \leq a \leq 1.10$, $0.97 \leq b \leq 1.00$, $0.0001 \leq c \leq 0.03$, $0.0001 \leq d \leq 0.03$, $1.98 \leq e \leq 2.02$, $0 \leq f \leq 0.02$, and $0.0001 \leq c + d \leq 0.03$), and where element A, element B and fluorine are evenly present in the vicinity of the particle surfaces, characterized in that the material is composed of secondary particles each formed by coagulation of 10 or more primary particles and that a cobalt raw material at least containing either cobalt oxyhydroxide or cobalt hydroxide, lithium carbonate, and a raw material comprising said element A and element B are mixed and fired.